Randi C. Williams

randiw12@mit.edu ▪ (301) 633-8837
20 Ames St, Cambridge, MA 02139
media.mit.edu/~randiw12/

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PROFILE

Pioneering AI and education researcher leveraging background in Computer Science (CS) and Engineering to pursue the ethical advancement of Artificial Intelligence (AI) for social good. Demonstrated impact at top Human-Computer Interaction and CS Education research conferences, and through successful academic and industry collaborations on large-scale projects. Passionate about leveraging technical knowledge and human-centered design to responsibly shape the future of technology and society.

EDUCATION

Massachusetts Institute of Technology (MIT), Cambridge, MA
Doctor of Philosophy in Media, Arts, and Sciences, 5.0/5.0 GPA   *Expected December 2023*
Dissertation: "Impact.AI: Democratizing AI through K-12 Artificial Intelligence Education"
Committee: Dr. Cynthia Breazeal (advisor, MIT), Dr. Hal Abelson (MIT)
        Dr. Tia C. Madkins (UT Austin), Dr. Jean Ryoo (UCLA)

Kaufman Teaching Certificate   December 2022

Master of Science in Media, Arts, and Sciences, 5.0/5.0 GPA   May 2018
Thesis: "PopBots: Leveraging Social Robots to Aid Preschool Children's AI Education"
Committee: Dr. Cynthia Breazeal (advisor, MIT), Dr. Marina Bers (Tufts)
        Dr. Paul Harris (Harvard)

University of Maryland, Baltimore County (UMBC), Baltimore, MD
Bachelor of Science in Computer Engineering, 3.977/4.0 GPA   May 2016

RESEARCH EXPERIENCE

MIT Media Lab, Personal Robots Group, Cambridge, MA   September 2016 – Present
Graduate Research Assistant advised by Prof. Cynthia Breazeal
- Conducting experimental studies on children's perceptions of AI agents
- Collaborating with industry partners to train educators to teach AI
- Leading development of open-source interactive robot and online AI programming platforms; (>1,000 users worldwide)
- Coordinating interdisciplinary teams building hands-on AI + ethics curricula for PreK-12 students
- Mentoring graduate and undergraduate teams through technical and education research projects; (17 undergraduate research mentees)

Microsoft Research, Research in Software Engineering (RiSE), Seattle, WA   Summer 2021
Graduate Research Intern supervised by Dr. Michał Moskal
- Built novel programming platform to train then deploy machine learning models on microcontrollers

MIT Lincoln Laboratories, Informatics and Decision Support Group, Lexington, MA   Summer 2016
Graduate Research Intern supervised by Dr. Jason Thornton
- Refactored computer vision system, achieving measurable improvements in accuracy and usability

UMBC, ECLIPSE Research Cluster, Catonsville, MD   August 2014 to May 2016
Undergraduate Researcher supervised by Dr. Nilanjan Banerjee
- Prototyped and tested a smart-textile wearable to diagnose Restless Leg Syndrome

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Research Experience (cntd.)

MIT Media Lab, Fluid Interfaces Group, Cambridge, MA   Summer 2015
Undergraduate Research Intern supervised by Dr. Niaja Farve and Dr. Pattie Maes
- Prototyped app that automatically records and displays activity tracking data from mobile devices

NASA Jet Propulsion Lab, Human-Robot Interfaces Group, La Cañada Flintridge, CA   Summer 2014
Undergraduate Research Intern supervised by Dr. Adrian Stoica
- Prototyped a text-to-speech and voice command system and virtual testbed for quadrotor teams

TEACHING EXPERIENCE

Semester-long courses, Teaching assistant

MIT Educational Justice Initiative (TEJI) and CSAIL, Cambridge, MA   Summer 2022
Brave Behind Bars Intro to Computer Science taught by Marisa Gaetz, Martin Nisser, and Dr. Emily Harburg
- Co-taught introduction to JavaScript, supported students' projects, led office hours

MIT Program in Media Arts and Sciences and EECS, Cambridge, MA   Spring 2019 & 2020
Democratizing AI through K-12 AI Education for All taught by Profs. Cynthia Breazeal and Hal Abelson
- Planned content for new project-based course for undergrad and graduate students
- Ignited students' learning through project advising, design critiques, class discussions, and office hours

Week-long workshops, Instructor

MIT MISTI and Monterrey Institute of Technology CS&T, Puebla, MX   Summer 2018
Beautiful Patterns Intro to Computer Science organized by Dr. Abel Sanchez
- Designed and delivered hands-on, unplugged lectures and computer lab instruction in English and Spanish for project-based introductory computer science course for high school girls

Center for Infants and Youth, Parque la Libertad, San José, Costa Rica   Summer 2018
PrimaryAI, K-2nd Grade AI Workshop
- Designed and delivered hands-on lectures (Spanish) for introductory AI and robotics course for elementary school youth

Guest Lectures: MIT 6.S062/MAS.S10 Generative AI in K-12 Education (Fall 2023), Harvard T217 Designing K–12 Computer Science Learning Experiences (Spring 2023), Harvard T022 How the Future of Work is Shaping the Future of Education (Spring 2020- Spring 2022)

RESEARCH FELLOWSHIPS AWARDED

- Microsoft Research PhD Fellow (10 recipients out of 500 applications)   2021
- LEGO Papert Fellow, MIT Media Lab (3 recipients, nominated by faculty)   2019
- National Science Foundation, Graduate Research Fellow (2,000 out of 10,000 applicants) 2018
- MIT Ida Green Fellow   2016
- National GEM Consortium Fellow   2016

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PEER-REVIEWED PUBLICATIONS

Areas of contribution: AI Education, AI Literacy, Human-Computer Interaction
Google Scholar citations = 1016, h-index: 13, i10-index: 14

Journals
- <u>Randi Williams</u>, Safinah Ali, Nisha Devasia, Daniella DiPaola, Jenna Hong, Stephen P. Kaputsos, Brian Jordan, and Cynthia Breazeal. 2022. AI + ethics curricula for middle school youth: lessons learned from three project-based curricula. International Journal of Artificial Intelligence in Education.

Conference Proceedings
- <u>Randi Williams</u>. 2022. Constructionism, Ethics, and Creativity: Developing Tools for the Future of Education with AI. In Proceedings of the 2022 IEEE Symposium on Visual Languages and Human-Centric Computing (IEEE VL/HCC '22).
- Tejal Reddy, <u>Randi Williams</u>, and Cynthia Breazeal. 2022. LevelUp: Automatic assessment of block-based machine learning projects for AI education. In Proceedings of the 2022 IEEE Symposium on Visual Languages and Human-Centric Computing (IEEE VL/HCC '22). ** Best paper award **
- <u>Randi Williams</u>, Michal Moskał, and Peli de Halleux. 2022. ML Blocks: A block-based, graphical user interface for creating TinyML models. In Proceedings of the 2022 IEEE Symposium on Visual Languages and Human-Centric Computing (IEEE VL/HCC '22).
- Tejal Reddy, <u>Randi Williams</u>, Cynthia Breazeal. 2021. Text Classification for AI Education. In Proceedings of the 52nd ACM Technical Symposium on Computer Science Education (SIGCSE'21). ** Won first place in ACM undergraduate student research competition. **
- <u>Randi Williams</u>. 2021. How to Train Your Robot: Project-Based AI Education for Middle School Classrooms. In Proceedings of the 52nd ACM Technical Symposium on Computer Science Education (SIGCSE'21).
- Brian Jordan, Nisha Devasia, Jenna Hong, <u>Randi Williams</u>, Cynthia Breazeal. 2021. PoseBlocks: A Toolkit for Creating (and Dancing) with AI. In Proceedings of the 10th Symposium on Education Advances in Artificial Intelligence (EAAI '21). AAAI, Menlo Park, CA, USA. *Supervised graduate/undergraduate team who took MAS.S65 course.*
- <u>Randi Williams</u>, Stephen P. Kaputsos, Cynthia Breazeal. 2021. Teacher Perspectives on How to Train Your Robot, A Middle School AI and Ethics Curriculum. In Proceedings of the 10th Symposium on Education Advances in Artificial Intelligence (EAAI '21). AAAI, Menlo Park, CA, USA.
- Phoebe Lin, Jessica Van Brummelen, Galit Lukin, <u>Randi Williams</u>, Cynthia Breazeal. 2020. Zhorai: Designing A Conversational Agent for Children to Explore Machine Learning Concepts. In Proceedings of the 9th Symposium on Education Advances in Artificial Intelligence (EAAI '20). AAAI, Menlo Park, CA, USA. *Supervised graduate/undergraduate team who took MAS.S65 course.*
- <u>Randi Williams</u>, Hae Won Park, and Cynthia Breazeal. 2019. A is for Artificial Intelligence. In Proceedings of the 2019 Conference on Human Factors in Computing (CHI '19). ACM, New York, USA.
- <u>Randi Williams</u>, Hae Won Park, Lauren Oh, and Cynthia Breazeal. 2019. PopBots: Designing an Artificial Intelligence Curriculum for Early Childhood Education. In Proceedings of the 9th Symposium on Education Advances in Artificial Intelligence (EAAI '19). AAAI, Menlo Park, CA, USA.
- Jacqueline M. Kory-Westlund, J. M., Hae Won Park, <u>Randi Williams</u>, and Cynthia Breazeal. 2018. Measuring Young Children's Long-term Relationships with Social Robots. In Proceedings of the 17th ACM Interaction Design and Children Conference (IDC) (pp. 207-218). ACM: New York, NY.

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Conference Proceedings (cntd.)

- Stefania Druga, <u>Randi Williams</u>, Hae Won Park, and Cynthia Breazeal. 2018. How smart are the smart toys?: children and parents' agent interaction and intelligence attribution. In Proceedings of the 17th ACM Conference on Interaction Design and Children (IDC '18). ACM, New York, NY, USA, 231-240. DOI: https://doi.org/10.1145/3202185.3202741.
- <u>Randi Williams</u>, Christian Vázquez Machado, Stefania Druga, Cynthia Breazeal, and Pattie Maes. 2018. "My doll says it's ok": a study of children's conformity to a talking doll. In Proceedings of the 17th ACM Conference on Interaction Design and Children (IDC '18). ACM, New York, NY, USA, 625-631. DOI: https://doi.org/10.1145/3202185.3210788.
- <u>Randi Williams</u>*, Stefania Druga*, Mitch Resnick, and Cynthia Breazeal. 2017. "Hey Google, is it OK if I Eat You?": Initial Explorations in Child-Agent Interaction. Proceedings of the 16th ACM SIGCHI Interaction Design and Children (IDC) Conference, ACM.

INVITED TALKS AND WORKSHOP PRESENTATIONS

- <u>Randi Williams</u>. 2023. Paths of exploration around Youth, AI, Policy, and Advocacy. Invited talk at the Kids & AI summit at the MIT Media Lab. Cambridge, MA, USA.
- <u>Randi Williams</u> and Cynthia Breazeal. 2023. Assessments for K-12 AI Literacy: A Comprehensive Review. Oral presentation at the AIED in K-12 Workshop at AIED. Virtual symposium.
- <u>Randi Williams</u>. 2022. Middle school AI + science: The micro:biome. Invited talk at the Computer Science Teacher's Association (CSTA) CS Across the Curriculum Summit 2022. Virtual symposium.
- <u>Randi Williams</u> and Andy Lippman. 2021. The Soul of a Robot. Oral presentation at the Emerging Technologies (EmTech MIT) Conference. Cambridge, MA, USA.
- <u>Randi Williams</u>. 2021. How to train your robot: Envisioning the future of education with AI. Invited talk at the Harvard Center for Research on Computation and Society, Rising Stars in AI for Social Good research series. Cambridge, MA, USA.
- <u>Randi Williams</u>. 2020. How to train your robot: Artifacts and curricula for grade school AI education. Oral presentation at the Arizona State University + Global Silicon Valley (ASUGSV) Summit 2020. San Diego, CA, USA.
- <u>Randi Williams</u>. 2020. Empowering children with (AI) education. Oral presentation at the 2020 AI Latin American sumMIT. Cambridge, MA, USA.
- <u>Randi Williams</u> and Cynthia Breazeal. 2020. How to Train Your Robot: A Middle School AI and Ethics Curriculum. Oral presentation at the International Workshop on Education in Artificial Intelligence K-12 (EDUAI '20).
- <u>Randi Williams</u>*, Safinah Ali*, Blakeley H. Payne*, Hae Won Park, and Cynthia Breazeal. 2019. Constructionism, Ethics, and Creativity: Developing Primary and Middle School Artificial Intelligence Education. Oral presentation at the International Workshop on Education in Artificial Intelligence K-12 (EDUAI '19). Palo Alto, CA, USA.
- <u>Randi Williams</u>, Cynthia Breazeal. 2018. PopBots: Leveraging social robots to aid early childhood artificial intelligence education. Oral presentation at the Black in AI workshop. Montréal, Canada.

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PROFESSIONAL SERVICE

MIT

- MIT Media Lab Culture Working Group, Member   2019 – 2020
- MIT Graduate Student Council, Diversity Conduit   2018 – 2021
- MIT Graduate Student of Color Advisory Council, Member   2018 – 2020

External Service

- Black in Robotics, Boston Chapter Co-director   2021 – Present
- Black in AI Research (BlackAIR) Summer Research Mentor   2021
- IBM Watson AI XPRIZE Judge   2019 – 2020

Reviewer for: International Journal of Artificial Intelligence in Education (2020-2022), Information and Learning Sciences (ILS 2022), Social Behavior and Personality Journal (2022), Conference on Human Factors in Computing (CHI 2020-2022), Black in AI Workshop (2019-2021), Human-Robot Interaction (HRI 2020, 2023), International Symposium on Robot and Human Interactive Communication (RO-MAN 2020)

RESEARCH MENTEES

Pablo Alejo	S.B.	MIT Mechanical Engineering
Tejal Reddy	S.B.	MIT Electrical Engineering and Computer Science
Vanessa Wanyandeh	B.S.	University of Pennsylvania Economics and Hispanic Studies
Masheika Allgood	-	ALLAI Consulting, LLC
Alyda Huerta	S.B.	MIT Mechanical Engineering
Salma Islam	S.B.	MIT Mechanical Engineering
Phoebe Lin	M.S.	Harvard University Graduate School of Design
Rogger Montes	S.B.	MIT Electrical Engineering and Computer Science
Mitchell Guillam	S.B.	MIT Mechanical Engineering
Ruben Peinado	S.B.	MIT Mechanical engineering
Peiling Jiang	B.S.	Jiangnan University Industrial Design
Yaseen Alkhafaji	S.B.	MIT Electrical Engineering and Computer Science
Lauren Oh	S.B.	MIT Mathematics & Electrical Engineering and Computer Science
Kyra Post	S.B.	MIT Mechanical Engineering
Jennifer Madiedo	S.B.	MIT Electrical Engineering and Computer Science
Aradhana Adhikari	S.B.	MIT Electrical Engineering and Computer Science

HONORS AND AWARDS

- Computer Science Ed Week CS Hero (nominated by CSTA board)   2023
- Cambridge Science Festival Curious Scientist of the Year (1 recipient, nominated by city)   2021
- Graduate Woman of Excellence, MIT   2019
- Unsung Hero, MIT (1 recipient, nominated by peers)   2019

EXTRACURRICULAR ACTIVITIES

- MIT Graduate Resident Assistant (RA)   2018 – 2023
- MIT Academy of Courageous Minority Engineers; Treasurer, President   2018 – 2020
- MIT MISTI – JayNii Streetwise Orphanage, Volunteer – Accra, Ghana   Summer 2019
- MIT Summer Research Program, Pod Leader   Summer 2018

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Extracurricular Activities (cntd.)

One-off workshops to broaden participation in AI: The Possible Zone Reinforcement Learning Deep Dive (2023), Future Makers Workshops with the Queen Liliuokalani Trust Center (2021) Boston Museum of Science Engineers Week - Speaker (2023), Innovators for Purpose - Generative AI Workshop Leader (Feb. and Nov. 2023), MIT High School Summer Program – Workshop Leader (2023), Career Girls - Role Model (2019), Girls who Code – Workshop Leader (2019), Mujeres + Tech STEM - Workshop Leader (2019), Brains On! Cambridge Science Festival - Panelist (2018), Cambridge Science Festival Robot Zoo – Participant (2017-2022), MAES Science Extravaganza – Speaker (2017), MIT Scratch Day – Workshop Leader (2017)

SKILLS AND INTERESTS

Technical Skills
- Web/Mobile Development: Android, HTML/CSS, JavaScript/TypeScript, React, Node.JS
- Software/Hardware Development: Java Python, C/C++, Arduino, Custom PCB fabrication
- Machine Learning: Tensorflow, SKLearn, Keras, MATLAB

Professional and Leadership Skills
- Communicating research impact through publications and presentations
- Coordinating interdisciplinary teams working on high-impact projects
- Acquiring resources and managing timelines for projects with strict deliverables
- Graphic design (GIMP, Canva, Inkscape)
- Course development, instruction, student support, mentorship
- Proficient in Spanish (reading, writing, teaching)

Hobbies
- Playing musical instruments – piano, guitar
- Traveling and exploring other cultures
- Hiking and enjoying the outdoors
- Learning new things (currently: roller skating, skateboarding, and rock climbing)